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ABSTRACT

This seminar report contains summaries of presentations as well as entire reports and addresses made at the Regional Seminar on Technical and Vocational Education in Asia and Oceania held in Singapore in November 1979. Chapter 1 summarizes the trends, problems, and innovations in technical and vocational education which were identified in presentations of country reports made by participants. Chapter 2 combines in one report the reports of the two working groups formed to discuss (1) planning, organization, and administration and (2) technical and substantive aspects of curriculum development and teacher education. Specific topics addressed include problems of implementation, teacher selection and development, and rural development. Chapter 3 sets forth the recommendations for consideration by government or educational agencies on issues at the national level (productive work--a learning experience involving actual work situations--and technical and vocational education in rural areas) and at the regional level (development of a technical and vocational education system suited to needs and conditions). Annexes include the seminar agenda and three inaugural addresses. (YLB)

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Technical and Vocational Education in Asia and Oceania

Report of a Regional Seminar
Singapore, 20-27 November 1979

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INTRODUCTION

Background

Member States in Asia and Oceania are seriously concerned with transforming their education systems to make them functional and relevant to national needs. The search for changes has focused upon both the quantitative and structural aspects as well as qualitative, and in particular strengthening effective links between education and work.

The Fourth Regional Conference of Ministers of Education and Those Responsible for Economic Planning in Asia and Oceania (Colombo, 1978) gave particular attention to the importance of technical and vocational education in the enhancement of human resources in the context of socio-economic development, in which science and technology play an increasingly significant role.

The Regional Seminar on Technical and Vocational Education in Asia and Oceania was convened by Unesco in pursuance of Resolution 1/4.3/1 of the General Conference of Unesco adopted at its Twentieth Session. It was organized in Singapore in November 1979 by the Unesco Regional Office for Education in Asia and Oceania, with the collaboration of the Colombo Plan Staff College for Technician Education.

Objectives of the Seminar

The Seminar was organized in order to:

- exchange experiences of the Member States in the development of technical and vocational education generally, and in particular in curriculum development with special reference to productive work.
- make suggestions on the strategies towards further development of technical and vocational education, and on actions to be taken at the national, regional and international levels to further such development. (Agenda, Annex I)

Participation

All Member States of Unesco in the region of Asia and Oceania were invited to participate in the Seminar. Twenty participants from 18 countries of the region and observers from organizations of the United Nations system and inter-governmental organizations attended the Seminar. (List of Participants, Annex II)

Each participating Member State sent in a report on technical and vocational education in the country. The country reports formed the principal working documents of the Seminar. In addition, background and reference documents were provided to the Seminar by Unesco and the Colombo Plan Staff College.

Inauguration

The inaugural ceremony took place at the Auditorium of the Regional Language Centre on Tuesday, 20 November 1979.

After the welcome addresses made by the Director of the Colombo Plan Staff College and the Director of the Unesco Regional Office for Education in Asia and

Oceania, the Seminar was inaugurated by H.E. Dr. Ahmad Mattar, Acting Minister of Social Affairs and Minister-in-charge of Vocational and Industrial Training Board, Singapore. (Inaugural address, Annex IV)

Office Bearers

Following the inauguration, the Seminar assembled in its first plenary session at the Colombo Plan Staff College and elected its officers unanimously: Dr. J.R. Veragara (Philippines) as Chairman, Mr. Vivek Pangputhipong (Thailand) and U Khin Maung (Burma) as Vice-Chairmen, and Mr. Noel Harrison (New Zealand) and Mr. Shafqat Hussein (Pakistan) as Rapporteurs. These officers formed the Steering Committee of the Seminar, supported by a Unesco and Colombo Plan Staff College secretariat. A Drafting Committee was appointed by the Steering Committee, consisting of the Chairman, the Rapporteurs, Dr. K. Gopalan (India), Dr. Noel Watkins (Australia), and the Unesco and the Colombo Plan Staff College Secretariat. Mr. N. Salikhov, Programme Specialist, Unesco ROEAO, acted as Secretary to the Seminar. Dr. C.K. Basu, Faculty Consultant, Colombo Plan Staff College acted as Co-ordinator on behalf of the College. (List of Office Bearers, Annex III)

Organization

The plenary sessions of the first and second day were devoted to the presentation of country reports by participants. The presentations included current trends, problems and innovations in technical and vocational education. These were followed by extensive general discussion. Thereafter the participants formed two Working Groups to discuss Agenda Item 5—Consideration of the Problems and Issues in Curriculum Development in Technical and Vocational Education, and recommendations for actions related to: (a) productive work as an integral component of technical and vocational education, and (b) adaptation of the conditions of the local economy. While both Working Groups discussed both topics, the composition of the first Working Group provided insights especially into planning, organization and administration in technical and vocational education with reference to the topics. The second Working Group, on the other hand, considered curriculum development and teacher education in the context of the two topics. Group discussions continued for five sessions. These were followed by three additional Working Group sessions, which considered further studies and research, Agenda Item 6. The Seminar met next in plenary for four sessions to consider the Group Reports and formulate its conclusions and recommendations, Agenda Item 7. In preparation for these discussions, the Steering Committee met several times to prepare a set of draft recommendations, based upon previous discussions during the Seminar. The Draft Final Report on the work of the Seminar was adopted at the final plenary session on 27 November 1979.

Acknowledgements

The Seminar placed on record its gratitude to Unesco for making this Seminar possible and for providing opportunities for a thorough review and exchange of experiences in technical and vocational education in the region. The Seminar also expressed its appreciation to Unesco and the Colombo Plan Staff College for efficient organization of the Seminar.

Chapter One

TRENDS, PROBLEMS, INNOVATIONS [1]

Trends

1. Technical and vocational education is now highly valued and is given greater priority in the use of resources in all countries represented at the Seminar. There is general realization that investment in education at all levels is essential to economic development and increased productivity. The special support for technical and vocational education is seen today more clearly as part of national socio-economic planning and is being integrated with social and political development policies.

2. This greater importance has manifested itself in Member States in a variety of ways. High-level national committees and commissions have reviewed recently the total technical and vocational education systems in several countries. Boards for specific aspects and sectors in industry, such as integrated rural development, automotive, building, and land transportation have been established to oversee the development of relevant personnel. Previously scattered programmes are increasingly being integrated and co-ordinated by high-level bodies. The number of institutions has increased significantly, as have the capital and recurrent expenditure on technical and vocational education. Key institutions dealing with technical and vocational education have been provided enhanced status or have been attached to prestigious institutions.

3. The increasing concern regarding the introduction of pre-vocational or vocational preparation, or socially useful productive work components in general education, is another manifestation of the importance attached to technical and vocational education.

4. This enhanced importance accorded to occupational training marks a new phase of educational growth for most countries. In the last 10 or 20 years technical and vocational education programmes were introduced rapidly, almost on a 'crash' basis, to meet urgent and immediate socio-economic needs. Now many of those first efforts are being reviewed and evaluated , especially in the context of the employment situation. Government planners and educators are trying to identify areas of duplication and waste, and to develop a comprehensive system which will serve the needs of individual communities, particularly in rural areas, and support national, social and economic policies.

5. Especially in planning, curriculum development, development of teaching/learning materials, evaluation, a marked improvement of professionalism is visible in most countries of the region, parallel to similar trends in these areas in general education. In several countries, such activities have already been institutionalized so that a permanent core of experts may devote themselves on a continuing basis to the reform of curricula and to the delivery of education in the entire technical and vocational education system.

6. Of special note is the fact that several countries in the region are initiating procedures for curriculum validation and evaluation, as well as learner evaluation, so

1. When the term 'industry' is used, it is meant in a broad sense to apply also to agriculture, and other appropriate operations and services.

that systematic feedback may be available for successive reform of the planning and delivery system. Both these aspects have found support from the actions taken in these Member States for the establishment of national skills standards in a variety of occupations. Increasing support for research and experimentation in technical and vocational education has also contributed to more systematic reform of the system.

7. Throughout the region, greater emphasis is being placed on the restructuring of systems which will bring training into closer co-ordination with the industrial, agricultural, and service agencies within the community, and so make courses and activities pertinent, practical, and flexible. Advisory committees and boards are being set up at national and, in some countries, at local levels. Wider participation in planning is being encouraged in a number of countries so that community needs can be understood more fully and priorities established in the employment of people and the use of scarce material resources. In a few countries, even legal measures such as apprenticeship acts, and fiscal measures such as tax benefits, have been introduced to provide for greater co-operation between the technical-and-vocational-education system and industry.

8. Relevance to the world of work of outputs of the technical and vocational education system has featured prominently in several high-level national analyses. In recent years, the concern for practicality of content, methodologies, delivery mechanisms and other aspects of the system has been clearly visible. The enhancement of relevance has been expressed through a variety of modalities, such as through the integration between theory and practice; increased use of optional or short courses; non-formal approaches—with or without mass media; community-based multi-purpose technical and vocational institutions; modular approaches to teaching/learning; credit systems and multi-point entry mechanisms; greater autonomy for institutions; and affiliated institutions dealing with specific local problems, including those of socially, economically or physically disadvantaged populations.

9. One strong trend in enhanced relevance to today's conditions that is emerging in some countries is the expansion of the practical component in technical and vocational education programmes, by combining or integrating the learning done within an institution with productive work in factories or in the community. Generally, educational needs take precedence over production requirements. In some other countries, commercial production is directly linked with training for the twin purposes of reinforcing the learning process and helping to offset some of the heavy costs of training.

10. The new, stronger role of technical and vocational education is shown not only by the greater resources being made available but also by a series of new approaches. These were discussed by the seminar participants in terms of rationalization of existing programmes, of standardized qualifications, of improvements to teacher training, and of curriculum development, particularly in relation to the growing emphasis on *learning* combined with *production*.

11. In particular, several Member States have taken teacher education as a priority area for action and have initiated multi-pronged strategies of emergency or 'crash' measures to meet immediate requirements, while simultaneously initiating longer-term systematic development of the teaching cadre, including the incorporation of integrated programmes for staff assessment and staff development which incorporate pre-service and in-service/continuing education.

12. Supporting networks for the supply of resources are also being set up. One new form of these is the system for the flow of knowledge between decentralized resource centres. These centres are linked to bases for the supply of multiple resources at national and sub-national levels, both within and outside the ministries of education.

13. While a great deal of enthusiastic reform is clearly under way in all countries in the region, it is also apparent that significant disparities exist between the plans and actual implementation at the field level. Member States have recognized these shortfalls. Current efforts at maintaining quality control mechanisms and corrective actions, though as yet small, indicate the seriousness with which countries are striving to put their planning into practice.

Problems and issues

14. The Seminar indicated a range of problems and issues which the Member States have to face in their current efforts in developing technical and vocational education notably,

- Shortage of buildings and equipment, as well as maintenance problems, in particular a need for low-cost scientific and technical equipment from locally available materials;
- Inadequacy of self-paced, or self-instructional learning resources and locally relevant textbooks;
- Shortage of experienced, qualified teachers, and recruitment and retention difficulties;
- Lack of co-ordination between governmental and private technical and vocational institutions;
- Insufficient co-ordination between general education, and technical and vocational education;
- An increasing number of young unemployed and under-employed, workers, the handicapped, and other disadvantaged groups who have to be provided technical and vocational education;
- Difficulty in keeping courses up to date so that the needs of industry can be met quickly in a time of rapid technological, economic and social change;
- Difficulty of devising a system which is national in scope and with uniformity of qualifications, but is also sufficiently flexible to meet local needs;
- Scarcity of work for graduating students.

15. Apart from these specific problems, there are also many basic issues, notably,

- Effectiveness of vocational and technical education systems, in terms of: planning and provision of appropriate courses; quality of teachers; curriculum development; evaluation techniques;
- Unemployment, and consequent social dislocation and economic waste;
- Expansion of opportunities to rural and other disadvantaged communities, with the dual purpose of community development and increased productivity, to support both social and economic growth;
- Relationship of education/training and productive/practical work, i.e., the relationship of the education system and the country's economic production systems;
- Development of alternative technologies, especially in the context of the energy crisis.

Innovations and experiments

16. The dynamism and determination for changes in technical and vocational education systems in Member States have created a large variety of innovations—some with major and far-reaching implications that can affect the entire structure and functioning of the system; others with more limited scope and function. Several of these innovations have been referred to earlier as examples of trends in technical and vocational education. Among other types of innovations are the following:

- Job analyses as preparation for curriculum design;
- Development of new delivery structures such as credit systems and multiple-entry procedures, to enhance opportunities for access to technical and vocational education;
- Development of learning modules to allow greater flexibility in the provision of courses, and meeting the individual needs of learners;
- Development of programmes which ease the transition from school to work;
- Development of new courses for the unemployed, the handicapped, and other disadvantaged groups;
- Commercially or economically productive work carried out as part of technical and vocational education programmes;
- Use by private industry of government facilities, in return for on-the-job training commitments for out-of-school youth;
- Development of Central Workshops providing vocational training for students from the nearby secondary schools;
- Development of mobile learning resources, particularly for rural use;
- Development of mobile vocational training units to serve remote rural areas where permanent facilities for such training do not exist;
- Development of formal and non-formal community education programmes and activities in rural areas.

Chapter Two

WORKING GROUP REPORTS

Introduction

1. For organizing the participants in two Working Groups, the scope and nature of the Seminar could be defined in a number of ways. The approach adopted was to incorporate three sets of considerations in a framework for discussion:

a) The functional and structural distinctions between administration and curriculum-cum-teacher training;

b) The process of policy formulation and programming, and implementation-cum-evaluation;

c) The 'dual' economy comprising the urban and rural sectors with different implications for technical and vocational education.

2. The 'dual' economic sectors reflect the demographic classification of some 20 per cent of population residing in urban areas and 80 per cent in rural areas—a pattern prevailing in almost all developing Member States of the Region. The needs, level of technology and economic conditions of the urban and rural sectors call for different but complementary sectoral approaches to the provision of technical and vocational education. Clearly, care must be taken lest the differential approaches to both sectors perpetuate social inequality and economic disparity between them. The considerations are arbitrary and do not represent water-tight compartments but, together, they served as convenient points of departure for the discussions of a complex subject.

3. In this context, both Working Groups discussed Agenda Item 5, with Group I concentrating on planning, organization and administration, and Group II on the technical and substantive aspects of curriculum development and teacher education. The two Group Reports have been amalgamated into a single report.

Summary of discussions

4. The two Working Groups discussed the problems and issues of curriculum development in technical and vocational education. They concentrated on the concept of productive work as an integral part of learning, and suggested ways in which it could be adapted to a local or regional economy. Both groups also gave special attention to questions relating to comprehensive approaches to rural development.

5. Both groups formulated tentative definitions of 'productive work' so that discussion could proceed without ambiguity. Productive work within an education or training programme was seen as an attempt to give more meaning and relevance to the theory and practice being provided as part of the curriculum. It could include the manufacture of saleable goods, the cultivation of agricultural produce, or the provision of services for which there is a demand.

6. One group felt that while the feature of actual profit may not always be present, productive work should involve a value which is attached by individuals or the community to the goods or services provided. The other group also felt that the

production of goods or services would have the additional advantage of partly offsetting the costs of training, as well as of contributing to the welfare of the community. This aspect was considered to be important in developing countries which have very few resources to allocate to technical and vocational education.

7. A definition of 'productive work' which was considered generally acceptable for discussion purposes is: *A learning experience combining the development of appropriate skills, knowledge and attitudes with an educational or training programme by involving learners in actual work situations, thereby reinforcing their studies and preparing them for employment.*

8. This definition emphasizes actual work situations rather than simulated conditions which often form the practical component of teaching programmes within a vocational or technical institution. This practical work is obviously of value and can, on occasions, be 'productive work' when, for example, a group of students construct a complete building as part of their skills course.

9. Among the important objectives of productive work as a component of technical and vocational education courses are the following:

a) To contribute to general education objectives; e.g.,
   - to introduce learners to the nature and values inherent in work;
   - to widen learners' choice of occupations;
   - to integrate the school experience with life experience;
   - to teach industrial arts.

b) To contribute to the achievement of technical and vocational education objectives; e.g.,
   - to teach particular specifically employable skills;
   - to provide the opportunity to get a comprehensive view of the agricultural, manufacturing, or service delivery processes.

c) To contribute to community welfare; e.g.,
   - to provide goods and services necessary to alleviate social problems;
   - to provide necessary items or services unavailable through regular means;
   - to provide a skilled labour supply.

d) To contribute to economic welfare; e.g.,
   - to help pay some of the costs of the education processes;
   - to utilize expensive resources which might otherwise be idle.

10. In the Member States, productive work already appears in many forms, depending on the particular trade or occupation involved. Among the common examples are the following:

- production in the teaching institution's own factories;
- placement for production in factories or other workplaces outside the institution (such as on-the-job training through apprenticeship schemes in many countries);
- production in the 'formal' workshops inside an institution (such as the production of tools, or printing jobs);
- services to the community, within the community (such as a variety of agricultural extension services, or pump repairs);
- services to the community at the 'formal' workshops in the institution (such as radio and motor-car repairs).

11. A number of clear advantages—educational, social and economic—resulting from the integration of productive work with the learning process were identified. They included the value of linking school experiences with the world of work, greater relevance of learning to life's situations, better understanding of the nature of work, a broadening of occupational choice, and increased opportunities for gaining marketable skills. Productive work could also be innovative and provide goods or services to a community which might not be gained in any other way. Participants also felt that this approach to training could more easily lead to the introduction of broader issues, such as *awareness of environmental concerns*, social attitudes, national priorities, safety and health factors, appropriateness of technologies, and energy sources—both conventional and non-conventional—and their conservation. Productive work, in addition, can present a variety of opportunities for the application, reinforcement and extension of *prior learning*, can provide experience of *team-work*, and of the dynamics of *social and economic change*.

Problems of implementation

12. The Working Groups acknowledged that in practice some very real problems could hinder the implementation of productive work schemes. The work chosen must be selected on the basis of its value as part of the learning process and not just be a convenient activity, or one for which the economic returns may be attractive but which has little educative value. Industrial enterprises, particularly those not run by the State, are often reluctant to provide structured programmes for students, because they can interfere with production schedules, or introduce extra complications —even though the work produced by students can be marketable. It is also often difficult to find industries, sufficiently accessible, with the skills appropriate for use in an integrated training programme. Some factors affecting the degree of liaison and extent of success in action include: the degree of legal machinery in operation supporting placement in industry; the level of the industry itself; the degree of cohesion in the industry, whether it is made up (for example) of a number of employees with a wide range of activities, or a number of employees with clear definition of activities.

13. Agricultural and related rural activities offer a number of practical possibilities, and some countries have already developed work-school training programmes in these areas. The learning institutions which actually own and operate farms, orchards and forests have been able to design teaching programmes which match seasonal work. This type of integration can be planned in detail because of the known requirements of the seasons. It can also make obvious economic contributions to training, and to the community.

14. Major difficulties can arise, however, if productive work schemes are introduced on a wider scale, either in urban or rural areas. Many of the examples presented by participants referred to relatively small-scale efforts, making use of special local features and resources. As soon as this approach is considered for wider implementation, serious problems arise regarding curriculum development, selection and training of suitable teachers and other resource people, and the establishment of local and educational priorities.

15. The Working Groups decided that a planned policy of implementation was essential, with a support structure allowing co-ordination of the activities of a

number of agencies. Productive work, to be successful, must be accepted as a concept by all those involved, and must be supported by organizers who are also educators, to ensure that the various components fit together flexibly and efficiently.

16. Initial planning and organization in which the interface between industry and the teaching institution is given constant attention, was seen as a crucial element for effective integration of productive work with education. Priorities must be fixed, and surveys carried out within communities to determine which schemes would have the greatest educational and socio-economic value. Participation of local industry must be actively encouraged, and liaison systems established. Task analyses of productive work must be done so that the competencies developed inside the educational institution can be fitted to the realities of the work-place and vice versa.

17. Methods also have to be devised so that the effectiveness of the two forms of learning—in the institution and in the work-place—can be evaluated. The experiences of the learner involved in productive work must be monitored so that further reinforcement can be provided in the teaching situation. A balance also has to be achieved when learners are being assessed so that some failure in the work-place does not lead to the assumption that no learning has taken place. Remedial measures must be applied in both spheres of learning—in the school and on the job.

Teacher selection and development

18. All participants agreed that the choice and preparation of teachers, again in both school and work-place, are of paramount importance. Work experience for the teachers was seen as vital and some participants indicated the types of programme they had devised to ensure that where a well-qualified teacher had no industrial background, work experience was provided (perhaps on the basis of a month a year, in an actual production situation).

19. The groups also recognized that a major contribution to the success of productive work schemes could come from local communities, from the crafts-people, technicians, skilled workers and agriculturalists who have built up a body of experience over many years. Experiments are being carried out in some countries with the formation of teams of people working at, for example, the village level. These are sometimes made up of a craftsman or master farmer, a teacher from the formal system, and a community leader, all working together on a particular project. Suitable training was also identified as an important consideration, both for the local resource people and the 'formal' teacher.

Teacher development should be viewed as a continuous and on-going process over the entire career of the teacher. Each programme needs to be structured not merely to meet the immediate needs of the teacher, but also to meet future needs. To identify strengths and weaknesses of a teacher, especially since many teachers are underqualified, and since 'non-teachers' may be utilized for aspects such as productive work, an effective staff appraisal system needs to be established, directly related to job specifications. The usual 'annual confidential reports' for promotion purposes do not meet these requirements. Appropriate staff development programmes should be designed based upon the data from staff appraisal.

20. The status of teachers within the community, and the ways in which teachers regard themselves and their own profession, was also seen as an issue. In some countries, technical and vocational education is in a formative stage and has not yet received full community recognition. The 'image' of teachers in this field is blurred,

and their status is not high. This makes recruitment difficult, particularly when industry, or other occupations, offer greater material rewards and prestige. Closer involvement of the educational institution with community activities was seen as one way in which the status of teaching could be raised—but the problem will remain while there is a 'stigma' attached to manual work.

Rural development

21. All countries in the region have adopted development policies emphasizing both economic and social development. In several of them, socio-economic policies which focus on the basic needs of the majority have been given priority. Some participants felt, however, that the emphasis during the 1950s and 1960s on rapidly increasing the Gross National Product had, in many instances, led to an imbalance in the use of resources, and a growing disparity between the haves and have-nots. This is particularly evident in the area of rural development, where the anticipated spill-over effects from the growth in the modern sector have not materialized.

22. As a consequence, many countries are now giving more consideration to ways in which comprehensive programmes of rural development can be carried out. The need for greater educational opportunities, both at the general primary and secondary levels, and in the technical and vocational facilities of education, is now generally accepted. The scarcity of financial resources, however, is forcing planners and those directly involved in production to look again at the potential of community resources which are immediately available—and at the possibilities of making more effective use of labour-intensive methods of production.

23. Several Member States have experimented with new approaches to these issues and participants gave examples of what is being attempted. Part of a production process may, for instance, remain capital-intensive for a narrow range of techniques, in the interests of high productivity, while the remainder of the process can be made labour-intensive. Changes in the actual productive process may also be made, resulting perhaps even in *minor reductions in quality,* so that greater use can be made of labour rather than capital. More local materials may be used, even if they are of a lower standard than the most-desired material. More intensive use of machinery through double-shift work results in greater utilization of labour, and in greater output, and in some countries efforts are being made to use second-hand machinery, to avoid the high initial costs in setting up a production process.

24. Where such changes are occurring the implications for technical and vocational education are immediate. These changes are more than a simple transfer of existing urban-based training systems into a rural or little-developed area. Special programmes are needed to reflect the specific needs and constraints of local communities. In this way the standard of skills currently being performed or new skills needed by a particular community, can be improved or developed, and contributions made towards solving local problems. Technical and vocational educational opportunities should be integrated with other developmental projects, such as irrigation, rural electrification, rural small industries, and a comprehensive approach taken toward community development in its social as well as economic aspects.

25. Both Working Groups emphasized the need to combine formal and non-formal methods of learning. Some of the issues raised for further consideration by planners included the emphasis to be placed upon entrepreneurial skills, the need to use local experience for skills training, to develop non-verbal methods of communication and

to make further studies of the value and the limitations of the use of graphic materials. Local participation in identifying needs and in making decisions about priorities was also stressed.

26. The Working Groups felt that many possibilities already exist in rural communities for the application of learning approaches through productive work. Because of the emphasis which would almost certainly be given to non-formal learning, many local human and material resources could be used. The indigenous methods and structures which have been created in rural communities should be used as the learning base, and then strengthened and developed. The use of local materials should be encouraged, first for simple reasons of economy and, more importantly, because of the growing significance of the world's over-consumption of energy. Alternative sources of energy should be developed and emphasis given to the conservation of scarce resources of energy and materials. These principles should be reflected in the curriculum content and methodologies in technical and vocational education programmes.

27. Attention was also given by the Working Groups to the organizational structures which would be needed. It was felt that committees would have to be set up at various levels for national, regional, local and institutional planning. These should include employers, employees, professionals and educators. Curriculum design was seen as an activity which would involve local community groups and local teachers, to ensure that the characteristics of the local environment are kept always in mind. This local participation is crucial because success depends on the willing support and co-operation of the community, and on close liaison with other agencies, groups and organizations involved in comprehensive rural development.

28. Some special areas of concern were also mentioned by participants. The different attitudes in various Member States towards the provision of educational opportunities in technical and vocational education for girls and women were discussed. Attention was drawn to the need for open access to such opportunities, and to involve women in planning and decision-making at community level. While the creation of special vocational schools for girls, in traditional home economics courses and secretarial skills, was considered, a strong emphasis was placed on the desirability of wider opportunities being made available, with all learners, male and female, having the same options, and being taught in the same manner in the same institution.

29. The use of correspondence courses, radio support programme, television as a direct teaching medium and modular lesson structures were also discussed in connection with rural development. Some countries are already experimenting with these and have established, for example, extensive programmes in correspondence education, supplemented by short periods of 'live' or practical teaching in regional or community centres.

30. The Working Groups also listed a number of areas which could be considered for surveys and research. These included ways of:

- developing information on capital and recurrent costs, and cost benefits;
- evaluating the effectiveness of learning systems in meeting community needs;
- devising ways of identifying local needs and local resources;
- developing formal and non-formal systems suitable for rural education;
- developing curricula which would be integrated with productive work, and with appropriate technologies;
- preparing non-verbal learning materials and self-learning modules.

31. Other issues and problems presented by participants were:

- provision of access to information needed for decision-making, including details of the experiences of various countries involved in innovative work;
- development of measures to improve the quality, quantity and motivation of teachers;
- establishment of centralized workshops for the development of curriculum materials, and other centralized workshops for optimum use of plant, equipment and staff;
- development of training courses for teachers in rural areas, or for taking part in rural development programmes;
- development of methods for introducing productive work into a wide variety of learning programmes;
- development of flexible systems which would allow entry by learners into training programmes at a number of different levels and times;
- development of special training programmes for entrepreneurs, or small business people, with the purpose of encouraging self-employment;
- initiation of research related to new technologies, materials and processes of production, preferably involving vocational teachers in the research;
- exploration of the effectiveness of locally specific productive work in technical and vocational education, in a community setting (such as through community colleges or affiliated centres).

Chapter Three

RECOMMENDATIONS

Introduction

In addition to the suggestions made at the plenary and group discussions, the Seminar considered the Revised Recommendation concerning Technical and Vocational Education adopted by the General Conference of Unesco at its 18th Session (1974), and the relevant recommendations of the Fourth Regional Conference of Ministers of Education and Those Responsible for Economic Planning in Asia and Oceania.[1]

The Seminar discussed the issues related to productive work as part of the learning process, and technical and vocational education in relation to rural development. It decided to make a series of recommendations for consideration by governments or educational agencies, and urged that priority be given to this approach to technical and vocational education.

The Seminar also discussed continuing education, and the appropriateness of formal and non-formal methods of learning. These points were taken into account when the following suggestions were being prepared, with the intention that many of these apply to relevant aspects of continuing education.

NATIONAL LEVEL

I. Productive work

A. Curriculum design, development and evaluation related to productive work

In these processes, the Seminar recommends that consideration be given to:

1. a) the proportion of time to be spent on productive work throughout each course;
   b) the proportion of time given at each level of technical and vocational education;
   c) the ways in which productive work is most appropriately undertaken:
      i) in the sandwich mode;
      ii) after the theoretical studies have been completed;
      iii) concurrently with theoretical studies, such as part-time study and part-time work;
   d) which aspects of the several objectives should be given priority at each stage of technical and vocational education;
   e) whether simulated work places or actual, real-life work places are more appropriate, specifically the placement of the productive work and whether it is best undertaken in:
      i) the educational institution's own training facility or workshop;
      ii) a special production unit or centre attached to the school;

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1. Fourth Regional Conference of Ministers of Education and Those Responsible for Economic Planning in Asia and Oceania, Colombo, 24 July-1 August 1978. *Final report.* Paris, Unesco, 1978. p. 14-17.

iii) an on-the-job site, in industry;*
iv) in a training centre attached to industry.

2. The appointment of officials to co-operate with, and to co-ordinate the activities of the teaching institutions and the industries and services, in order to:
   a) work out with industries or services the nature of the productive work experience required by the learners;
   b) explain to the teaching institutions the nature of the curriculum most required by the learners to fit them for work in the industries or services;
   c) assess the effectiveness of the productive work experience;
   d) provide vocational guidance to learners.
3. Providing equal access in all areas of technical and vocational education to boys and girls, men and women.
4. Providing special opportunities for those who are disadvantaged, such as those handicapped by poverty or physical problems.
5. The need to give priority to the educational objectives of technical and vocational education programmes (that is, to contribute effectively to the learning process) rather than to allow the production outcome to be of greater importance.
6. The desirability, within the process of curriculum design and implementation, of including:
   a) surveys of manpower needs to determine necessary priorities in implementing courses and associated productive work programmes;
   b) task analyses of jobs in industries so that courses may be designed in terms of appropriate behavioural objectives and the correct productive work experience be provided;
   c) analyses of the learners' productive work experience to assist further reinforcement of learning in the institution.
7. The incorporation of productive work as an integral and essential component of the curriculum by involving the following design actions:
   a) task analyses of productive work jobs for matching with the competencies developed in institutional training, and specification of behavioural objectives for systematic curriculum development for the institutional programme;
   b) surveys of the community for location of service needs and subsequent task analyses of these;
   c) placement of the productive work experience in the total learning sequence planned for the learner to ensure the most effective reinforcement and new learning;
   d) analyses of the experiences of the learner in productive work for further reinforcement of learning in the institution.
8. The incorporation of productive work experiences early in school education and its continuation, with greater emphasis and sophistication, into technical and vocational education.

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* When the term 'industry' is used, it is meant to apply to agriculture and other appropriate operations and services, as well as to modern-sector activities of manufacturing and urban services.

9. Flexible design of the curriculum in order to allow for productive work to be completed either on the job or in a school situation.
10. Decentralizing, to the local level, decision-making about the curriculum in order to facilitate the implementation of both productive work and course work.
11. The use of local resources and materials in curriculum development.
12. The inclusion in the curriculum documents of:
    a) the relationship of productive work objectives to the course objectives;
    b) recommended teaching sequences necessary to link productive work to theory;
    c) methods of assessment of the productive work for in-course and terminal purposes;
    d) the proportion of overall assessment to be awarded to productive work.
13. The degree of importance to be given to such factors as cost effectiveness, entrepreneurial skills and marketing.
14. Methods of evaluating productive work in the curriculum, including the:
    a) relevance of productive work to the overall curriculum;
    b) problems of implementation of productive work;
    c) problems of procurement of resources, and problems concerned with finished products.

B. Staff development for productive work

In this connection, the Seminar recommends that consideration should be given to:

1. The policy decisions that should be made and carried out about the recruitment and development of staff.
2. The importance of recruiting staff who are experienced and able in productive work.
3. Policy decisions about the proper and necessary status of teachers. (Note: policy statements should acknowledge that a skilled educational staff is as important a resource as are facilities and finance in the provision of technical and vocational education. Steps should be taken to accord technical and vocational education staff the status which matches the importance of their contribution to social and economic development. Specifically they should be paid salaries and employed under terms of service which are at least as attractive as those they would obtain in industry).
4. Given present difficulties in recruiting people, the design of staff development programmes and their high priority to support the successful introduction and maintenance of productive work in technical and vocational education programmes.
5. Preparing staff development programmes for all personnel engaged in productive work programmes—including policy-makers, teachers, instructors, administrators and clerical staff, industry liaison officers and personnel in industries.
6. The inclusion within pre- and in-service staff training programmes, of courses and activities which foster positive attitudes toward productive work and which

enhance skills in planning and managing productive work programmes. The trained staff, may thereby become agents of curriculum reform capable of integrating productive work with technical and vocational education programmes and administrating such programmes, particularly with regard to facilitating the liaison and interface with industry.

7. Staff development programmes which include the requirement that personnel undertake and be given appropriate recognition for such activities as:
   a) pre-training industrial experience or,
   b) periods of 'return to industry' after the pre-training course so that the teacher may both bring existing skills up to date and learn new ones.
8. Allocating priority to staff development programmes for skills necessary to carry out productive work.
9. Designing staff development programmes which produce teachers competent in the skills required for productive work, together with the necessary theory and attitudes.
10. The design and implementation of staff development programmes which can be carried out by staff at the local level (including enhancing the competence of local staff to allow this to be done).

C. Development of learning resources for productive work

In this context, the Seminar recommends that consideration be given to:

1. The development of materials directed to a variety of groups (teachers, instructors, administrators and clerical people, students, and personnel engaged in industry—employers, union members, and the self-employed).
2. Materials which would explain:
   a) the aims and objectives of productive work;
   b) the importance of productive work in technical and vocational education courses;
   c) the complementary roles of each group—their rights and responsibilities;
   d) the types of productive work which are most suitable.
3. The development of guidelines for both the learners and the industries, which:
   a) indicate the details of the curriculum which the learners are undertaking;
   b) indicate the types of productive work they should have;
   c) record what productive work each learner has undertaken.
4. The development of worksheets for productive work which may consist of:
   a) the objectives of the productive work experience;
   b) the necessary pre-requisite theory;
   c) the materials required;
   d) the methods of production.

D. Planning and organization for productive work

The Seminar recommends that consideration be given to:

1. The determination of policies which should be made at each appropriate level affirming the importance of productive work programmes as a necessary component of technical and vocational education.

2. The establishment of effective national support structures to co-ordinate activities among a number of agencies.
3. The establishment of productive work committees, comprising members from industries and the community, at appropriate levels—particularly the local level—to:
   a) advise the technical and vocational education authorities on the needs for, the provision of, and the effectiveness of such programmes;
   b) assist with the liaison and interface between the educational institution and industries;
   c) provide assurance of relevance of the programmes to changing demands.
4. Appropriate legislation and legal offices for such arrangements as learner stipends, insurance and, agreements with employers;
5. Official inspection systems which might be applied to the implementation plan to ensure that there is co-operation between the institutions and the industries.
6. The adjustment of class scheduling in technical and vocational education programmes to facilitate the inclusion of productive work.

E. Research and development for productive work

In regard to this area, the Seminar recommends that consideration be given to:

1. Action-oriented research and development programmes which might be initiated to investigate the effectiveness of curriculum development programmes; specifically:
   a) the existing research literature to be analysed, synthesized and disseminated;
   b) case studies and longitudinal studies of curriculum development programmes and their effectiveness within the geographical area.
2. Action-oriented curriculum research and development programmes which might be initiated in co-operation with staff development programmes, specifically:
   a) the existing research literature might be searched, synthesized and disseminated;
   b) case studies and longitudinal studies of staff development programmes within the geographical area.
3. The establishment, by each country, of a National Technical and Vocational Education Clearing House, which will co-operate with a Regional Clearing House. The clearing house service is an urgent need in all countries in the region, to prevent wasteful duplication of efforts, and to facilitate immediate supply of resources.
4. Determining the functions and operations of such clearing houses, which could have as their primary mission the collection and dissemination of all available information about productive work programmes within the Member States; specifically:
   a) research and development activities;
   b) course design and implementation activities;
   c) staff development activities;
   d) learning resources development and production;
   e) planning and organization of programmes;
   f) provision of and utilization of resources;
   g) statistics including cost data and other information.

5. The range of items to be included, such as descriptions of research studies; descriptions of successful programmes (lists of objectives, descriptions of learning resource materials, examples of learner record cards); accounts of effective procedures (liaison between institutions and industries); and location of people with particular expertise who may be consulted. (Selection of items should be governed by their validity and usability to the potential users).
6. How the retrieval system could be kept simple and readily available to practitioners and administrators in the field.
7. The method of operation of such clearing houses, specifically:
   a) a regular contribution of items to the clearing house headquarters;
   b) a standard format for listing items, such as:
      – title of the item;
      – classification and code;
      – grade level;
      – brief description of the information, materials and activities;
      – location—name and address of the source.
   c) a printed booklet, or loose-leaf sheets which list the existing items and are regularly added to, on a quarterly basis;
   d) the likelihood that the clearing house would cover topics other than 'productive work'; for example, *rural technical and vocational education, teacher education* and the like. (It would be necessary to use a coding system which could be expanded as required).
8. The allocation of funds for the purpose of establishing the clearing houses.

II. Technical and vocational education in rural areas

The Seminar recognized that the issues raised concerning productive work as part of the learning process had a special relevance to the expansion of technical and vocational education in rural areas. For this reason, a separate section was set aside for some recommendations.

The Seminar had an opportunity to discuss only a few of the major issues relating to technical and vocational education in rural areas, and has been able to make only a few recommendations. Participants felt that discussion at much greater depth is necessary. It is declared, therefore, that more seminars are needed specifically to discuss and make recommendations on this matter.

A. Curriculum

In this connection the Seminar recommends that consideration be given to:

1. The value of relating the curriculum to the needs of the community.
2. The flexibility of curriculum design, to allow for regional differences in rural areas to suit local needs (possibly leading to a modular approach).
3. Basing the curriculum upon a survey of the area where it is to be taught, learned and used.
4. Emphasis upon entrepreneurial skills.
5. Basing the design of the curriculum on current and emerging patterns of development, and providing for new skills which will diversify employment, including self-employment opportunities.

B. Development of staff

For this area, the Seminar recommends that consideration be given to:

1. Staff development programmes which emphasize entrepreneurial skills.
2. Programmes which aim to improve the skills and attitudes necessary for rural development.
3. Programmes which aim to provide teachers with the necessary skills and attitudes to develop curriculum and learning resources for rural areas.
4. Programmes designed to allow staff to become involved in community activities.
5. Including in teacher training programmes, optional components which develop skills and attitudes appropriate for technical and vocational education in rural areas.
6. The use of local expertise and resources, wherever practicable, in the conduct of staff development programmes.

C. Learning resources development

In relation to these the Seminar recommends that consideration be given to:

1. The establishment of central workshops for the development of resource materials related to rural areas.
2. The involvement of the local community in the production of resources.
3. The development of resources which facilitate distance learning (e.g. radio, TV, self-instructional materials).
4. The development of resources at the appropriate level of sophistication and cost-effectiveness.

D. Planning and organization

In this context the Seminar recommends that consideration be given to:

1. Policy decisions being made at each appropriate level which affirm the importance of special technical and education programmes for rural areas.
2. Rural area committees comprising of educational and local members being established to:
   a) advise the technical and vocational education authorities on the needs for the provision, and the effectiveness, of such programmes;
   b) assist with the liaison and interface between the educational institution and industry;
   c) ensure recognition and acceptance.

E. Research and development for rural areas

In this connection the Seminar recommends that consideration be given to:

1. The development of techniques to evaluate the needs of rural areas in order that relevant curriculum be designed.
2. The development of special modules for teacher training for rural areas.

REGIONAL LEVEL

The primary objective of inter-country co-operation at the regional level will be to contribute to the enhancement of the capacity of each Member State to develop an appropriate technical and vocational education system suited to its needs and conditions, in particular with respect to integrating productive work in the system and contributing to rural development.

Unesco, the Colombo Plan Staff College, and other organizations and institutions that have regional coverage, have important work to do in enhancing those national capacities. In addition to direct support to national level actions, activities such as the following may be taken account of when Unesco and other organizations plan their regional programmes related to technical and vocational education:

1. Action oriented studies, such as those which investigate:
   - the existing role of productive work, such as income-generating activities, work experience and socially useful activities in relation to educational content, paying attention to different socio-cultural milieux, and to needs in human resources development at different stages of development;
   - alternative strategies aimed at making educational content, structures and teaching methods at the different levels relevant to social, cultural and economic development needs;
   - the occupational preferences and employability of secondary school leavers.
2. Policy-oriented studies such as those which investigate:
   - necessary changes in curricula, methods and other relevant aspects of the educational system in order to develop attitudes, skill and knowledge in their graduates that are conducive to their employment;
   - ways and means of assisting graduates in their efforts to obtain employment for themselves.
3. Exchange of experiences and personnel among the countries in regard to innovative developments in technical and vocational education—and in particular integration of productive work in technical and vocational education—and contributions to rural development, such as through:
   - regional and sub-regional meetings;
   - study tours.
4. Inter-country transfer of expertise through means such as:
   - regional and sub-regional training programmes including those specifically for curriculum development and staff training;
   - mobile teams for in-country training courses;
   - placement and attachment programmes in which staff from one country are attached as fellow workers to relevant projects in another country for on-the-job training.
5. Co-operative research on problems of common concern among two or more countries, particularly those related to costs, curriculum design and development, and human resources development aspects.
6. At the request of Member States, assist in carrying out joint appraisal studies of the problems in the country relating to the development of technical and vocational education.
7. Establishing a Regional Technical and Vocational Education Clearing House in Asia and Oceania (RETVECH/AO) for the exchange of information and documentation, at the most appropriate place for the effective functioning of the Clearing House; i.e. in close association with curriculum design and development programmes and staff development programmes at a regional level. Further, in the manner that Unesco has assisted Member States in establishing

a national system for scientific information, similar assistance should be provided for a national information system for technical and vocational education. Considering the urgency for interchange of information, documentation services may be initiated immediately through existing regional agencies. The National Technical and Vocational Education Clearing Houses should be 'networked' into the Regional Clearing House Service. Member States will retrieve information from the Regional Service, and will have responsibility to contribute to the Regional Service on a regular basis.

8. In support of the above activities, establishing a Panel of Experts from the Member States in the Region, to monitor and review periodically the progress of technical and vocational education in the Region, and advice on emerging aspects of regional co-operation and regional action.*

* At the final plenary session, the Seminar adopted a resolution proved by Dr. K. Gopalan (India) and seconded by Mr. N.P. Bhattarai (Nepal) emphasizing the importance of a regional clearing house service and the establishment of a panel of experts.

ANNEX I

AGENDA

1. Opening of the Seminar

2. Election of Officers of the Seminar

3. Consideration of Provisional Schedule of Work

4. Review of the development of and current trends in technical and vocational education in the region

5. Consideration of the problems and issues in curriculum development in technical and vocational education and recommended actions related to:
   a) Productive work as a component of technical and vocational education
   b) Adaptations to the conditions of local economy

6. Problems for further studies and research

7. Consideration of recommendations for co-operative action programmes in technical and vocational education, particularly in the implementation of the Revised Recommendation concerning Technical and Vocational Education

8. Adoption of the Final Report

9. Closing of the Seminar

ANNEX II

LIST OF PARTICIPANTS

Participants

Afghanistan	Mr. M. Osman President Vocational Education Department Ministry of Higher and Vocational Education, Kabul
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	Mr. Narayan Prasad Bhattarai Chief, Building Planning Unit Ministry of Education, Kaiser Mahal, Kantipath Kathmandu
New Zealand	Mr. Noel Harrison Director Northland Community College, Private Bag Whangarei
Pakistan	Mr. Sharqat Hussain Principal Government College of Technology, Lahore
Philippines	Dr. Jose R. Vergara President Technological University of the Philippines P.O. Box 3171, Manila
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Socialist Republic of Viet Nam	Mr. Cao Hong Phong Deputy Director Thu Duc Technical Teacher Training College Ho Chi Minh City
	Mr. Vu Hung, Interpreter
Sri Lanka	Mr. J. H. Dayaratne Principal, Junior Technical Institute Kurunegala

Thailand	Mr. Vivek Pangputhipong Director-General, Department of Vocational Education Ministry of Education, Bangkok
Union of Soviet Socialist Republics	Dr. Ivan Dubov Chief, Department of Committee on Technical and Vocational Education c/o Commission of the USSR for Unesco Ministry of Foreign Affairs 9 Kalinine Avenue, Moscow G-19

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Director

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Colombo Plan Staff College for Technician Education, Singapore

Dr. L.S. Chandrakant	Director
Mr. Rob Allaburton	Faculty Consultant
Prof. M.A. Bari	"
Dr. C.K. Basu	"
Mr. Michael Buck	"
Mr. David Chantrill	"
Prof. Eiji Kuniyoshi	"
Prof. P.B. Patil	"
Mr. Ian Reece	"
Prof. K. Sitaramarao	"
Prof. Thávisakdi Srimuang	"
Mr. Abdul Rahim Yusoff	"
Mr. A. Rafique	Programme Officer

ANNEX III

OFFICE BEARERS OF THE SEMINAR

Chairman

J. Vergara
President
Technological University of the Philippines, Manila, Philippines

Vice-Chairmen

1. Vivek Pangputhipong
   Director-General
   Department of Vocational Education
   Ministry of Education, Bangkok, Thailand

2. Khin Maung
   Director-General
   Department of Technical, Agricultural and Vocational Education, Rangoon, Burma

Rapporteurs

1. Noel Harrison
   Principal, Northland Community College
   New Zealand

2. Shafqat Hussain
   Principal, Government College of Technology
   Lahore, Pakistan

STEERING COMMITTEE

Jose Vergara
Vivek Pangputhipong
Khin Maung
Noel Harrison
Shafqat Hussain
Unesco Secretariat
CPSC Secretariat

DRAFTING COMMITTEE

Jose Vergara
Noel Harrison
Shafqat Hussain
N. Salikhov
J. Ratnaike
Ian H. Reece
C. K. Basu
Noel Watkins
K. Gopalan

ANNEX IV

INAUGURAL ADDRESSES

Welcome Address by Dr. L. S. Chandrakant, Director, Colombo Plan Staff College for Technician Education

On behalf of the Colombo Plan Staff College and on my own behalf, I welcome you to the inauguration of this Regional Seminar on Technical and Vocational Education in Asia and Oceania.

To you, Mr. Minister, we are deeply grateful for honouring us with your presence and agreeing to inaugurate the Seminar.

The Staff College is only five years old. Although this is a very short period in the life of an institution, the College has reached out to 20 countries in the Colombo Plan region in the field of technician education and training. During this period it has had the privilege of working with over 1,000 persons from these countries, who are actively engaged in developing and improving technician education systems. This Seminar which Unesco has asked us to organize has provided the Staff College with another opportunity to acquire new perspectives for its activities. We welcome this opportunity and are thankful to Unesco for placing the Staff College in a larger international framework.

Singapore has earned reputation as an important convention centre in this part of the world. But, the choice of this venue gives the Seminar a unique setting in which the distinguished delegates will find their deliberations rewarding. Singapore has ably demonstrated what a country with practically no natural resources can achieve by way of economic progress through the development of its human resources. It is also here in Singapore that we may see, in a very practical way, the role of education and training in human resource development and as an instrument of social and economic change. We are therefore privileged to have Dr. Ahmad Mattar, Minister in Charge of Vocational and Industrial Training, to inaugurate the Seminar and extend to us the benefit of his valuable advice and guidance.

Many factors influence the pace and direction of economic progress of our countries. Capital, natural resources, international trade, government and social institutions all play important roles, but none is more important than man himself. In the final analysis, it is the urges and know-how of men which determine whether minerals stay underground or are transformed into articles useful to man; whether oil remains hidden or becomes a source of heat and power; whether roads remain mud tracks or are transformed into arteries of trade and commerce; whether people have more and better food, better housing and better health.

All development studies must therefore recognize the importance of the human factor—the education, training and energising of human resources.

There is another aspect of development, which is a matter of urgent concern for our countries. It is to provide adequate access to employment. As the ultimate purpose of development is to provide increasing opportunities to all our people for

a better life, it is essential to raise substantially the level of productive employment. To fail on this front is to fail in our development effort. Our national development objectives should be such as to absorb an increasing proportion of the working population in modern types of activity and to reduce significantly unemployment and under-employment. Not only does unemployment and under-employment deny large sections of the population of an acceptable quality of life; it is also a barrier to further development. In our countries, unemployment is turning into a major social problem and obstacle to development. The failure to create meaningful employment is the most tragic feature of development.

All this and more imply that the objective of development is not merely to increase national income, but to ensure that such increases lead to improvements in the standards of living of vast numbers of people at the bottom of the income distribution pyramid. It also implies that progress cannot be measured merely in terms of economic growth rates; it must satisfy other important indicators, more significantly, levels of employment, levels of nutrition, levels of housing, health, education and so on. Employment must take its place along with GNP and of equal importance—as a central object of concern in development planning and as an essential criterion of progress in development. A policy for economic growth is compatible with a policy for employment expansion, provided that as much attention is devoted to the organization, methods and composition of production as is given to its volume.

The basic concern of this regional seminar is to search for those qualitative changes which are needed to make our technical and vocational education systems relevant to our national development objectives. In particular, how to link education with productive work, bring together the act of learning and the context of action and re-establish the educational systems in the mainstream of our societies' life processes in which science and technology have an increasingly important role.

All our countries have institutionalized various forms of technical and vocational education, particularly at the secondary and tertiary stages. We have in our countries technical and vocational schools, polytechnics, technical training institutes, institutes of technology and so on which are not only growing in number, but are increasingly diversifying their curricular offerings. Nevertheless, we are also aware that in many of these systems the major weakness is the lack of a work-education spectrum which is necessary to integrate learning with the application of knowledge to solve problems in real life situations, and thus develop the all-round capacities of the students. In the absence of the interlinking, education in our countries has tended to lay exclusive stress on cognitive development, rather as our critics say, theoretical or 'bookish' learning. Unesco has stressed:

> "When education is put back in the context of action and work, education becomes an experience in which young people find real problems and difficulties that require learning individually and collectively and in which they can use and sharpen what they are learning. Work actions have their own specific rhythm and patterns which challenge the learner's full capacities of experience and learning. This provides opportunities to the learner to bring together in an integrated way what he may have learnt from various disciplines separately; to learn and appreciate performance standards that every productive activity requires; and most importantly, to grow into the social discipline of team work, joint responsibility and co-operative human relationship."

> "Interlinking of education and work is not intended to substitute on-the-job learning for the knowledge and skills acquired by studying any subject in depth. Rather, it is to give added dimension to such knowledge and insight by relating them to real problems and life situations."

This Seminar will, we hope, provide an opportunity to the distinguished educational experts from the regional countries to share their ideas and experiences on this important issue and make in depth study of the forms and processes by which productive work experience could be designedly incorporated in the curricular offerings of our educational systems. Apiece with this study, the Seminar will address itself to the question of how teachers should be trained and equipped for effective implementation of productive work component as well as organizational and administrative set-up needed at national and institutional level.

It is no longer necessary to argue for the relevance of our technical and vocational education systems to our countries' socio-economic needs. But, unfortunately, our perspectives of relevance tend to be orientated towards the urban, organized sectors of economy, like manufacturing, commerce, services and other modern wage sectors which exercise a dominant position over the flow of skilled manpower and thus over the pace and direction of our educational effort. In many of our regional countries, a very large proportion of the people live in rural areas and are mainly dependent on agriculture, forestry and fishing. Not only are these people deprived of access to any useful form of technical and vocational education in their own economic setting, but there is a widening gap between the skills generated in the present education systems and the needs of rural economies. One of the important factors responsible for rural poverty is lack of income generating technical skills and entrepreneurial ability in the rural people.

The Seminar will therefore give particular consideration to the question of how technical and vocational education may be brought into the mainstream of rural life in a meaningful way, what type of curricular offerings are relevant to these peoples' needs and how to mobilize community resources and community participation in this enterprise.

These issues are the main focus of the Seminar and our endeavour is that the deliberations should lead to specific action oriented programmes in key areas like curriculum innovations, teacher training, instructional resources development, planning methodologies, so that our regional countries may establish closer co-operation on a continuing basis. It is also our hope that in this co-operative effort, Unesco, ILO, Colombo Plan and other international agencies will extend their valuable support.

On this note, I welcome you again and thank you for being with us this morning.

Statement by Mr. Raja Roy Singh, Director
Unesco Regional Office for Education in Asia and Oceania

Your Excellency Dr. Ahmad Mattar, Minister in-charge,
Government of the Republic of Singapore

Excellencies,

The Director, Colombo Plan Staff College for Technician Education,

Distinguished Participants,

Ladies and Gentlemen,

It is an honour as it is a pleasure for me on behalf of Unesco, to extend a most cordial welcome to you to the Inauguration of this Regional Seminar on Technical and Vocational Education in Asia and Oceania which is convened by Unesco jointly with the Colombo Plan Staff College for Technician Education. May I on behalf of Unesco and on my personal behalf express our gratitude to Your Excellency for being with us this morning to inaugurate it. Your presence with us despite the heavy calls on your time by affairs of State is a measure of your profound interest in the theme of the Seminar as well as in the cause of regional co-operation.

I would like to express our gratitude to the Singapore National Commission for the courtesies extended, and to the Regional English Language Centre for the generous facilities it has provided for the organization of the Seminar.

A major thrust in education in many countries in Asia and Oceania is to relate education to development, which has implied transforming the education systems to make them functional and relevant to national needs. An important aspect of this transformation process is in the area of technical and vocational education as a means of human resources development. The countries of this vast region have in recent years searched and explored a wide range of approaches in order to develop technical and vocational education suited to their needs and developmental purposes and responding to the criteria of relevance and effectiveness. This Seminar brings together specialists and educators from 19 Member States in Asia and Oceania. It is the first Seminar of its kind at the regional level which Unesco has convened in Asia and Oceania and we are particularly glad that we are doing it in co-operation with a distinguished regional institute, namely the Colombo Plan Staff College. We are profoundly grateful to the distinguished participants and their Governments for responding to our invitation. They represent a unique range of educational experiences, diverse but also mutually complementary. There are many problems each country faces but there are also many problems in common the solution to which is facilitated by the insights and experiences that each has to contribute. It is in this spirit that this Seminar will address itself to the current problems and issues in technical and vocational education in this region and formulate its conclusions and recommendations for co-operative action.

May I request Your Excellency to inaugurate and address the Seminar.

Address of Dr. Ahmad Mattar, Acting Minister for Social Affairs and Minister-in-charge of Vocational and Industrial Training Board, Singapore Polytechnic and Ngee Ann Technical College

Allow me first of all to welcome all foreign participants of the Seminar to Singapore. For many of you this is perhaps not your first time in Singapore. All the same, welcome again. It gives us great pleasure that Unesco and the Colombo Plan Staff College for Technician Education should have decided to hold this Seminar here.

Singapore has been described by others in many ways: 'instant Asia', 'the melting-pot of the Orient', 'cross-roads of the world', 'Convention City', just to name a few. However, we Singaporeans would like to think of ourselves as a modern Asian city-state, with a unique way of life and personality of our own.

Singapore has always been and still is one of the great trading ports of the world. We are a major financial centre in Asia, and a growing centre for specialist technical and brain services. We are a notable focus of tourism. For the continued progress of our economy and our social infra-structure, we look to the development of all these sectors parallel with our industrial base.

We are, as you know, a cosmopolitan people. Besides our four official languages, namely Malay, Mandarin, Tamil and English, many other languages are spoken and heard in Singapore. Our people are accustomed and pleased to see visitors. So, please feel welcome. Feel free to look around and discover us. I hope you will find our country congenial, and that you will carry back with you favourable impressions and memories of your stay in our island Republic.

The subject of technical and vocational education is very close to our hearts. Our population of 2.3 million is our only resource. To sustain our economic growth our concern is to raise the education, skills and discipline of our workforce, so that we can in the 80s progress to the next level of technology and management, and higher incomes. In the last ten months alone the following major developments in education and training have taken place in Singapore:

In February 1979, Parliament approved comprehensive changes to our primary and secondary education system. It was, in fact, an approval to the total restructuring of our education system.

On 1 April 1979, the Vocational and Industrial Training Board (VITB) was formed by the amalgamation of the former Industrial Training Board and the Adult Education Board, to be the single national authority for vocational and industrial training in Singapore, including continuing education.

In July 1979, in a speech delivered at the official opening of the S$47 million campus of the Singapore Polytechnic, our Prime Minister declared that in the next ten years more of our population must be qualified for tertiary education without lowering standards. He envisaged 10 per cent of the present intakes into technician training going instead to the

universities, and 20 per cent of present vocational intakes going instead to technician-level training.

In the same month, the Government announced the policy to restructure the economy by promoting high-skill, high-technology and high value-added industries.

In October, the Skills Development Fund Levey Act, 1979, became law. All employers are required to pay a levy of 2 per cent on the wages of all employees earning less than S$750 per month to be used for the training of workers.

Being in your special ways experts you will, I am sure, appreciate the implications of these developments in terms of technical and vocational education. They constitute a total re-definition of our manpower policies for the 1980s, during which we hope to achieve our Second Industrial Revolution. The holding of this Seminar in Singapore could not, therefore, have been better timed. The subject is highly relevant to us. Our own circumstances and stage of development no doubt differ in many ways from those of your respective countries. The most notable would be the absence of an agricultural base, and our size—or lack of it. To the extent you share our problems, we hope developments taking place here will add insight to your deliberations.

Economic and social progress is accompanied by and dependent upon an ever-widening base of technical skills and vocations. Technical and vocational education therefore represents the means for an increasing proportion of the population to upgrade their economic performance, and thereby make possible the progress sought. Both workers and employers are becoming increasingly aware of this fact and are clamouring for it. At a seminar held by our National Trade Union Congress recently on 'Progress into the 80s', no less than 16 of the 35 recommendations that emerged dealt with vocational development. Without doubt, for most developing countries, the constraint to social progress in the 1980s will be adequate skills. I am aware that in many of your countries developments are taking place in vocational education and training as momentous for you as ours are for us. Collectively for us the developing countries, the coming decade may well emerge as the Vocational Development Decade.

The Unesco and the Colombo Plan Staff College for Technician Education must be congratulated for organizing this Seminar for the region. Embraced within our region and represented here are countries in every stage of economic advance. We can and must learn from one another as much as possible, adapting general experience to our own local requirements. Much of the methodologies, organizational forms, physical and equipment requirements, curricula, and post-training experiences have been developed and evaluated. By sharing resources and exchanging experiences, we can compress the time-frame for the progress of our peoples and evolve an economic complementarity among ourselves and with the advanced countries.

Technical co-operation therefore assumes an even greater role with the progress of each country, both through the Technical Co-operation among Developing Countries (TCDC) and technology transfers from the developed countries. It is a mistaken view that technical assistance from the latter should diminish in proportion to a country's advance. The problem of the latter in fact becomes more complex with

development, and the need for technical assistance more selective but crucial. I hope your deliberations will reinforce this point. Needless to say, from all points of view, the best possible world is one in which all countries can advance in mutual advantage and fulfil their economic and social aspirations.

I have been impressed with the documentation and preparations for this seminar. I have no doubt it will be a richly rewarding experience for you as well as in concrete results for general use.

It gives me great pleasure to inaugurate this Regional Seminar on Technical and Vocational Education for Asia and Oceania.